| | SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT<br>*ENGINEERING & COMPLIANCE*<br>APPLICATION PROCESSING AND CALCULATIONS | **PAGES:** 6 | **PAGE:** 1 |
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| | | **A/N:** 331746 | **DATE:** 2/10/2010 |
| | | **PROCESSED BY:** Meredith Hankins | **CHECKED BY:** |

# RULE 1123 (REFINERY PROCESS TURNAROUNDS) COMPLIANCE PLAN

**COMPANY NAME:** ConocoPhillips (Carson)

**COMPANY ID:** 800362

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**BACKGROUND:**

ConocoPhillips-Carson Refinery is subject to Rule 1123 when performing refinery process turnarounds. Rule 1123(b)(1) prohibits venting to the atmosphere of any organic materials unless the vapors are "collected and contained for use as fuel or sent to a gas disposal system until the pressure in the vessel is below five pounds per square inch, gauge, or is within ten percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower."

Rule 1123(b)(2) requires a compliance plan to be submitted to the District for every refinery that uses gas displacement or vacuum eduction to purge vessels during turnaround. The following criteria (at minimum) are required in this plan:

A) the procedure used for gas displacement or eduction
B) the disposition of the displaced or educed gases
C) the stage in the displacement or eduction procedure at which the disposition is changed from a control facility to atmospheric venting
D) the criteria by which said stage is identifiable.

In other words, the compliance plan requires **at least** a description of the gas displacement/eduction procedures, and explanations of where the gases go following the displacement/eduction, when the vessel is opened to the atmosphere, and how they determine when they can open to the atmosphere.

Rule 1123(c) requires certain records to be kept for two years, but since this is a Title V facility, records will be kept for the required 5 years.

The fees submitted with this application are shown below. This application was incorrectly submitted and accepted as a type 40 (Change of Ownership) applications and was charged with the associated application fees. This application has now been changed to a type 25 (Plans &

Excavations) and will be charged an additional fee to account for the difference (as well as any additional billing for T&M as per Rule 306).

**Table 1 – Fee Summary**

| A/N | Application Status | Fee Sched. | Fee Paid | Fee Required | Balance Due |
|---|---|---|---|---|---|
| 331746 | 21 | C | $256.00 | $76.80 | $0.00* |

*Please note that additional billing for T&M as per Rule 306 will be charged

**Table 2 – Relevant Permitting History**

| Date | Event | Description |
|---|---|---|
| 02/14/92 | Application Submitted | Unocal submitted Rule 1123 plan to the District for evaluation under A/N 262645. |
| 06/29/92 | Plan Approved | Unocal's Rule 1123 Plan approved under A/N 262645. |
| 03/27/97 | Application Submitted | Change of ownership application (Unocal to Tosco) for 1123 plan submitted under A/N 331746. |
| 11/09-12/09 | Additional Information Requested and Type Changed | A/I request sent to ConocoPhillips-Carson asking for updated Rule 1123 plan in order to complete evaluation of A/N 331746. Application type changed from 40 to 25. |
| 12/04/09 | Plan Submitted | ConocoPhillips submitted an updated Rule 1123 Plan to the District for evaluation following above A/I request. |

**PLAN EVALUATION:**

**Table 3 – Checklist for a Rule 1123 Compliance Plan**

| Requirements | Per Rule 1123 (b) (2) | Compliance? | | Remarks |
|---|---|---|---|---|
| | | Yes | No | |
| The procedure used for gas displacement or eduction | (A) | X | | Conoco included procedures for "High Hazard" and "Low Hazard" openings based on whether their "Safe Clearance Criteria" could be met and/or measured. These procedures are discussed in more detail below. |

| Requirements | Per Rule 1123 (b) (2) | Compliance? | | Remarks |
|---|---|---|---|---|
| | | Yes | No | |
| The disposition of the displaced or educed gases | (B) | X | | Gases displaced during turnaround procedures are sent first to the relief system at such a rate as to stay within the capacity of the flare gas recovery system (FGRS) and to minimize flaring. |
| The stage in the displacement or eduction procedure at which the disposition is changed from a control facility to atmospheric venting | (C) | X | | Equipment/systems are not opened to the atmosphere until all the Safe Clearance Criteria have been met. |
| The criteria by which said stage is identifiable. | (D) | X | | The Safe Clearance Criteria are the following four limits:<br>1) LEL < 10% (4.5.1),<br>2) $H_2S$ < 10ppm (4.5.2),<br>3) Benzene < 1ppm (4.5.3), AND<br>4) Pressure < 1-2psig (4.5.4)<br>Testing for the above Safe Clearance Criteria is done no more than 1 hour before vessel opening at different vent points to obtain a representative sample for the equipment or system (5.5.2, 3).<br>Liquid level and pH may also be considered in determining when the vessel can safely be opened (4.6.1, 2). |

*Please note: (X.Y.Z) citations refer to section numbers within Conoco's submitted Policies & Procedures Manual.*

**Additional Discussion of Turnaround Procedures**

Conoco's Policies & Procedures Manual (P&P) entitled "Preparing Process Equipment for Opening" contains detailed instructions for system turnarounds for both Conoco's Carson and Wilmington facilities. It contains procedures for emptying vessels of hydrocarbon and non-hydrocarbon liquid streams, as well as vapors. As Rule 1123 only covers *vapors* displaced during turnarounds, the procedures included for liquid streams will not be covered in this evaluation. Along with the P&P

document, please refer to email from Marshall Waller dated 1/12/10 for additional clarification on Conoco's turnaround procedures (for both the Carson and Wilmington facilities). The procedures below have been paraphrased from the P&P document and the abovementioned email.

ConocoPhillips divides their turnaround procedures into two main types: "High Hazard Openings" and "Low Hazard Openings." They classify openings for which the Safe Clearance Criteria can be met as Low Hazard, and those for which the Safe Clearance Criteria cannot be met as High Hazard.

The first step prior to any vessel opening is determining whether it will be a Low or High Hazard opening. If the Safe Clearance Criteria cannot be measured, it is assumed that unacceptable levels are present in the vessel and the procedure for a High Hazard opening is followed.

Low Hazard Openings

Once it has been determined that the Safe Clearance Criteria can be measured and met, the procedure for a Low Hazard opening is followed. Appropriate Operations and Environmental personnel are informed prior to any planned venting to the relief system (flare gas recovery system + flare) to ensure that excessive flaring is prevented and that venting occurs at such a rate as to stay within the capacity of the flare gas recovery system (FGRS).

Following the initial venting to the FGRS, any remaining vapors are further removed using gas displacement. Vessels may be purged with steam or nitrogen, depending on the commodities present in the equipment. Vapors displaced during gas displacement are sent to the relief system. Vessels are purged until all the Safe Clearance Criteria (LEL<10%, $H_2S$<10 ppm, Benzene<1 ppm, Pressure<1-2 psig) are met. During gas displacement, vessels are purged until they are "hot", meaning that the vessel is purged for a long enough time period to ensure they are "uniformly hot so there are no cold pockets with un-purged hydrocarbon."

Once the vessels reach relief system pressure (1-2 psig), they are bled to the atmosphere. The vessels are fully opened once atmospheric pressure is reached inside the vessel. This is allowed under Rule 1123, as the vessel pressure is below 5 psig.

High Hazard Openings

When the Safe Clearance Criteria cannot be directly measured (ie, a representative sample of the atmosphere inside the vessel cannot be obtained), additional precautions are taken to ensure the safety of the workers.

The same general procedure is followed for High Hazard openings as for Low Hazard openings—initial depressurization to the relief system, then gas displacement to remove remaining vapors. However, additional precautions are taken before opening to the atmosphere, as the contents inside the vessel cannot be directly determined. Precautions include additional PPE requirements, along with other restrictions. Regardless of the other Safe Clearance Criteria, vessels are never opened to the atmosphere unless "zero energy state," meaning zero gauge pressure, is confirmed.

**CONCLUSIONS AND RECOMMENDATIONS:**

ConocoPhillips-Carson's compliance plan for Rule 1123 includes all of the necessary information required by 1123(b)(2). The plan provides for the maximum feasible control of emissions by

sending all turnaround vapors to the relief system made up of a flare gas recovery system and a flare. The plan also complies with the flare minimization goals of Rule 1118 (and the "maximum feasible control" mandate set by Rule 1123) by sending turnaround vapors to the FGRS by default, and only sending vapors to the flare in situations allowed by Rule 1118. Their objective is always not to flare, even when allowed by Rule 1118, in order to avoid "bothering their neighbors" (see email from Marshall Waller dated 1/6/2010).

As per Rule 1123(b)(3), plans should be approved if they provide for maximum feasible control of emissions of displaced or educed organic gases without causing damage to equipment, malfunction of pollution control or safety devices, or violations of safety regulations. Conoco's compliance plan dated 12/4/09 meets all of the requirements laid out by 1123(b)(3). Therefore approval of Conoco's Rule 1123 Refinery Process Turnarounds Compliance Plan is recommended subject to the following conditions:

1. Refinery process turnarounds shall be conducted in accordance with the attached plan dated December 2009, unless otherwise specified below.

2. During refinery process turnaround, the vapors released from the vessel shall not vent to the atmosphere at any time unless the vessel has been depressurized to below 5 psig, or is within 10 percent above the minimum gauge pressure at which the vapors can be collected, whichever is lower, and has met all the requirements in Condition No. 3 and 4 below.

3. To depressurize vessels pursuant to Condition No. 2, the vapors released from the vessel shall be recovered by the flare gas recovery system (FGR system). The vapors released from the vessels may be directed to a flare provided that all flares have been operated in accordance with flaring minimization procedures pursuant to Rule 1118(c)(3) and (c)(4).

4. If inert gases are used for refinery process turnaround, the operator shall comply with all of the following requirements:
    - (A) Prior to introducing inert gases into the vessel, the operator shall initially depressurize the vessel in accordance to Condition No. 2 and 3.
    - (B) After introducing inert gases into the vessel, the vapors released from the vessel shall be recovered by the FGR system.
    - (C) Condition No. 4B above shall not apply if the facility operator can demonstrate that recovering the vapors would result in: (i) equipment damage due to incompatibility with recovery system equipment or with refinery fuel gas systems, (ii) malfunction of pollution control equipment or safety devices, or (iii) violations of safety regulations. The vapors are permitted to be routed directly to the flare if condition (i), (ii), or (iii) is met and provided that all flares have been operated in accordance with flaring minimization procedures pursuant to Rule 1118(c)(3) and (c)(4).

5. The operator shall keep records of each refinery process unit turnaround, in a manner approved by the AQMD, for the following items:

- The date the unit was shut down.
- The date, time, and hydrocarbon concentration measured when the vapors from the vessel were first discharged into the atmosphere.
- The approximate amount of hydrocarbons emitted into the atmosphere.
- Records to demonstrate that condition No. 4C is applicable

The records shall be kept for at least five years and made available for District inspection upon request.